

**BLOCKCHAIN AND FINTECH INNOVATION
(A CASE STUDY OF SELECTED FINTECH FIRMS IN NIGERIA)**

BY

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**DEPARTMENT OF ENTREPRENEURSHIP UNIVERSITY OF BENIN
BENIN CITY, NIGERIA
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**SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF A BACHELOR OF SCIENCES {BSCENT - B.SC.
ENTREPRENEURSHIP} DEGREE, IN THE FACULTY OF MANAGEMENT
SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA.**

JULY, 2024

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JULY, 2024

DECLARATION

This is to declare that this work is based on the extensive case study undertaken by **OVIawe ENDURANCE** in the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin, Benin City, Edo state, Nigeria. Under the supervision of **MR. AARON ANAMA**.

I further affirm that this work has not been previously submitted for the award of any degree or certificate elsewhere. At least to the best of my knowledge, this research work was written. All ideas, opinions, and views are the product of my research, and where the views of others have been expressed, they are being duly acknowledged.

OVIawe ENDURANCE

DATE

CERTIFICATION

This is to certify that this project was carried out by OVIawe ENDURANCE with Matriculation Number MGS1808152 of the Department of Entrepreneurship, Faculty of Management Sciences, University of Benin, Edo State, Nigeria.

MR. A. AARON ANAMA
(Project Supervisor)

DATE

DR. E. E. ENOFE
(Project Coordinator)

DATE

DR. (MRS) A. C. ORAKWUE
(Head of Department)

DATE

DEDICATION

I humbly dedicate this project to an ever-gracious God for his grace upon my life and for the privilege of the opportunity to start and complete this program.

I wish to dedicate this work to my loving parents. (Mr. Samuel & Mrs. Susan Oviawe) and my beloved brothers and sister for their support throughout my academic pursuits.

God blessing upon y'all, Amen.

ACKNOWLEDGEMENT

Special thanks and gratitude go to the Almighty God for his endless grace and mercy toward me. I also want to give special thanks to my family for their financial and moral support, which has helped me thus far.

My sincere gratitude also goes to my supervisor MR A. AARON ANAMA for his understanding and corrections throughout this project.

I want to thank the staff and management of the Department of Entrepreneurship, University of Benin, for their advice and guidance; MR A. AARON ANAMA as well as other department staff members.

I say God blesses you all. Amen.

ABSTRACT

This research explores the influence of blockchain technology on fintech innovation inside selected organizations in Nigeria. Employing a mixed-methods research strategy, the study combines questionnaires and interviews to acquire extensive data from professionals in the fintech business internationally. The purposive sampling approach targets organizations actively participating in blockchain technology and fintech innovation, embracing varied areas such as banking, finance, and technology. Through the use of industry reports and structured surveys, the analysis focuses on operational variables such as the adoption of fintech innovation and blockchain technology, as well as the impact on efficiency.

While qualitative data from interviews are subjected to thematic analysis, quantitative data are subjected to statistical tools for regression analysis, correlation analysis, and descriptive statistics. Ethical concerns are maintained throughout the study, guaranteeing informed consent, confidentiality, and safe data preservation.

The Land Information System (LIS) is unfamiliar to a significant percentage of respondents (52.8%), according to key findings, underscoring the need for improved education and training. With 20.8% of users using LIS daily and 26.4% using it infrequently, the frequency of use varies, suggesting opportunities to further integrate LIS into regular practices. The survey also highlights the diverse occupational backgrounds of respondents, with significant representation from surveyors (18.9%) and government officials (9.4%).

The study's findings disprove theories that blockchain has no applications or advantages and demonstrate the technology's widespread adoption and significant benefits in fintech companies. Obstacles including exorbitant implementation expenses and intricate regulations are noted, underscoring the necessity of well-defined regulatory structures and training initiatives tailored to the blockchain technology. Government policies, which support programs like tax breaks and public-private partnerships to promote innovation, have been demonstrated to have a major impact on the adoption of blockchain technology.

The results highlight how blockchain may revolutionize Nigeria's fintech sector and call for deliberate steps to improve worker competency, technical innovation, and regulatory clarity. Prospective investigations ought to examine the influence of regulatory sandboxes on the adoption of blockchain technology and its function in augmenting financial inclusion in Sub-Saharan Africa.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Blockchain and fintech innovation are two rising trends that have the potential to significantly reshape Nigeria's economy and society. Blockchain is a decentralized, distributed ledger system that ensures the authenticity and security of digital assets like cryptocurrencies, smart contracts, and digital identities. Fintech, on the other hand, involves using technology to provide financial services that are more accessible, cost-effective, and efficient than traditional methods. Nigeria, being one of Africa's largest economies and most populous countries (World Bank, 2023), boasts a thriving fintech ecosystem. This ecosystem includes payment systems, digital banking, and cryptocurrency, all spurred by the country's high mobile phone penetration and the large portion of the population that remains unbanked. These factors highlight the need to address financial inclusion, streamline remittances, enhance payments, and support e-commerce. According to Frost and Sullivan (2022), the fintech sector in Nigeria is forecasted to generate \$543.3 million in revenue by 2025, up from \$153.1 million in 2017. The report emphasizes how fintech uses technology to offer financial services more efficiently. Recent years have seen remarkable growth in Nigeria's fintech sector, driven by increasing mobile usage and the large unbanked population (McKinsey & Company, 2023). According to the EFINA Access to Financial Services in

Nigeria Survey, around 36.6 million Nigerian adults remain unbanked, representing approximately 36.8% of the adult population (EFInA, 2020). Fintech companies in Nigeria are leveraging blockchain technology to introduce innovative financial services aimed at underserved groups. Additionally, the Central Bank of Nigeria (CBN) has supported fintech advancements by offering a regulatory sandbox for companies to trial their products and services (CBN, 2021).

Blockchain technology is a decentralized digital ledger designed to securely and transparently record transactions. Its innovative use within the fintech sector is opening up new opportunities in the financial landscape of various economies, including Nigeria. Fintech companies are utilizing blockchain for a variety of applications, such as payments, where blockchain enables faster, more affordable, and more secure transactions. Fintechs are leveraging blockchain in numerous areas, such as lending, investment management, identity verification, and trade finance. The wide range of blockchain applications in fintech underscores the technology's significant impact on the delivery of financial services. Examining these use cases is essential to fully grasp the potential advantages and challenges blockchain presents. Such research can guide policymakers, regulators, and financial institutions as they develop strategies to adopt and integrate this transformative technology.

This study focuses on the role of blockchain in driving fintech innovation in Nigeria, using specific fintech companies as examples. These firms have embraced blockchain to introduce

disruptive changes to traditional financial services (Ezegbe, Nwachukwu O., 2022). As a key fintech hub in Africa, Nigeria has seen rapid growth in blockchain adoption within the financial sector (MasterCard, 2023).

Blockchain's potential to transform the financial industry lies in its ability to offer more efficient, secure, and cost-effective solutions for conducting financial transactions. Consequently, fintech companies around the world are incorporating blockchain to revolutionize areas such as lending, investment, identity management, trade finance, and digital banking. This technology creates a secure, transparent, and decentralized system for financial transactions, eliminating the need for intermediaries like banks. As a result, it reduces transaction costs, speeds up transaction processing, and enhances financial inclusion.

In Nigeria, as in other regions, fintech companies are applying blockchain technology in various sectors, including payment systems, remittances, microfinance, and digital identity management (PwC Nigeria, 2023). For instance, Afriex, a Nigerian fintech startup, has developed a blockchain-powered money transfer platform that converts funds into stablecoins, making transactions faster and fee-free compared to traditional services (TechCrunch, 2021). Similarly, Ripple uses blockchain to facilitate cross-border payments, completing transfers in seconds rather than the several days typical of conventional banking. Bundle Africa, a cryptocurrency exchange platform, simplifies the process of buying and

selling cryptocurrencies while offering a peer-to-peer money transfer service that allows users to send and receive funds using cryptocurrency.

1.2 STATEMENT OF RESEARCH PROBLEM

The use of blockchain is driving fintech innovations in Nigeria. As already noted several fintech firms are already using blockchain to address various users' pain points that are not currently addressed by institutions in the traditional financial sector. In light of the potential benefits of blockchain and fintech, the CBN has even gone ahead to introduce its cryptocurrency i.e eNaira and currently working on establishing its stablecoin called cNGN. Such benefits include Unlocking financial inclusion, combating corruption and enhancing transparency, boosting efficiency and reducing costs, and empowering individuals and communities. The CBN's Bold Move: eNaira and cNGN: Recognizing the potential of blockchain, the CBN has launched its digital currency, eNaira, and is spearheading the development of cNGN, a stablecoin pegged to the Nigerian Naira. These initiatives aim to further promote financial inclusion, facilitate cross-border payments, and enhance the overall efficiency of the financial system.

To the best of the researcher's knowledge, few studies have attempted to explore how blockchain technology drives fintech innovations in Nigeria. This study aims to fill this gap by using selected fintech firms in Nigeria.

This approach will help provide a detailed understanding of the benefits and challenges of blockchain adoption in the Nigerian Fintech industry and provide recommendations on how to improve the adoption of blockchain technology in the industry. Therefore, the research problem relies on the existing literature and conducting a study of selected fintech firms in Nigeria to understand the extent to which blockchain technology is being utilized and its impact on Nigeria's fintech industry.

1.3 RESEARCH QUESTIONS

Based on the problem statement, this study will be guided by the following research questions:

- i. What are the key use cases of blockchain technology in fintech firms?
- ii. What are the benefits of using blockchain technology in fintech firms?
- iii. What are the challenges associated with the adoption of blockchain technology in fintech firms?
- iv. How do government policies encourage the use of blockchain in fintech firms?

1.4 OBJECTIVES OF THE STUDY

The broad objective of the study is to examine how blockchain technology is driving fintech innovation in Nigeria. However, the specific objectives are:

- i. To identify the key use cases for blockchain technology in the fintech industry
- ii. To ascertain the benefits of using blockchain technology in the fintech industry

- iii. To identify and analyze the challenges encountered by fintech firms in the process of adopting blockchain technology.
- iv. To examine and assess the impact of government policies on the promotion and facilitation of blockchain technology adoption within fintech firms.

1.5 RESEARCH HYPOTHESIS

The hypotheses of the study are stated in the null form as follows:

- i. Hypothesis 1:** There are no use cases of blockchain by fintech firms in Nigeria.
- ii. Hypothesis 2:** There are no benefits associated with the use of blockchain by fintech firms.
- iii. Hypothesis 3:** There are no significant challenges faced by fintech firms in the process of adopting blockchain technology.
- iv. Hypothesis 4:** Government policies do not have a substantial impact on the promotion and facilitation of blockchain technology adoption within fintech firms.

1.6 SCOPE OF STUDY:

The purpose of this study is particular to fintech in Nigeria and a targeted number 100 of fintech users adopting the use of blockchain in Nigeria will be surveyed, focusing on the application and the impact of blockchain technology in the country's financial technology sector. The study aims to provide an in-depth analysis of the current state of blockchain adoption in Nigeria, identify key use cases and challenges, and evaluate the prospects for blockchain-driven fintech innovation.

1.7 SIGNIFICANCE OF THE STUDY:

This research will contribute to the existing knowledge of blockchain technology in emerging markets, specifically Nigeria, and provide insights for policymakers, industry practitioners, and researchers in the field.

This study holds significant importance in several key areas. It can foster financial inclusion by identifying blockchain's potential to provide secure and efficient financial services to the unbanked and underbanked populations in Nigeria. It can encourage technological innovation by evaluating the prospects of blockchain adoption, inspiring local innovators to explore blockchain-based solutions and driving economic growth. The study will inform policy decisions by providing insights into regulatory frameworks that foster blockchain adoption, address challenges, and promote a conducive environment for fintech innovation. The study can enhance cyber security and trust by analyzing challenges and developing strategies to mitigate potential risks associated with blockchain adoption. It can also support Nigeria's competitiveness in the global financial landscape by identifying success factors for fintech firms and promoting best practices. Finally, the study contributes to academic research by providing evidence-based insights and serving as a valuable resource for scholars and researchers exploring the implications of blockchain technology in emerging markets.

1.8 LIMITATION OF THE STUDY:

This study has certain limitations that should be acknowledged. The findings may have limited generalizability beyond the context of Nigeria's fintech industry, as the unique socio-economic and regulatory landscape of the country may influence the results. The inadequate numbers of fintech firms in Nigeria with access to the team may affect the results. The rapidly evolving nature of the fintech and blockchain industries may render the study's findings less applicable to future developments. External factors beyond the researcher's control and time and resource constraints also contribute to the study's limitations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction:

This chapter provides an overview of the existing research and scholarly articles related to blockchain and fintech innovation. It explores the intersection of blockchain technology and the financial technology (fintech) industry, focusing on the applications, challenges, benefits, and implications of blockchain adoption in the fintech sector. By examining the current body of knowledge, this review aims to identify key themes, research gaps, and emerging trends in blockchain and fintech innovation.

2.2 CONCEPTUAL REVIEW

In this section, we delve into the intersection of Blockchain and Fintech innovation. This segment explores the theoretical framework and foundational concepts surrounding the integration of blockchain technology within the financial technology landscape. We'll examine how blockchain's decentralized nature and principles contribute to reshaping traditional financial systems and fostering innovation in the fintech sector. It has also been found that fintech innovation often relies on basic advances in non-financial areas, such as computer science, IT, and software technology (Chen M. A., Wu Q, Yang B., (2019).

Fintech has a rich historical perspective, with its roots tracing back to the late 19th century when money could be moved around by telegraph. Over the years, fintech has evolved through various significant stages, driven by the use of technology to improve the delivery of financial services (The Payment Association (2020)).

The theoretical background of fintech innovation is rooted in the intersection of finance and technology, and its historical perspective demonstrates a continuous evolution driven by technological advancements. The literature provides insights into the various factors influencing fintech innovation and its impact on the provision of financial services.

2.2.1 Fintech Innovation

The term "fintech," a combination of the words "finance" and "technology," was first introduced in academic literature by Eduardo Z. M., Mauro de M. S., and Marly M. de C. in 1972. It describes innovations in financial services made possible by technological advancements, leading to new applications, processes, or products that significantly impact how financial services are delivered (Alaassar A, Mention AL, Aas TH, 2020). The growth of fintech has been fueled by developments such as blockchain, open banking, and cryptocurrencies (The Payment Association, 2020).

Fintech, which merges financial services with technology, refers to any software, app, or technological solution that enables individuals or businesses to access, manage, or analyze

their finances digitally, or to complete financial transactions (Trificana J., 2020). It encompasses a broad spectrum of innovations, including mobile banking, digital payments, blockchain-based currencies, peer-to-peer lending, robo-advisors, and more (Zavolokina L., Dolata M., & Schwabe G., 2016). The goal of fintech companies is to streamline financial processes, enhance accessibility, and foster innovation in the financial sector.

The term fintech represents the fusion of finance and technology, leading to new and improved financial services (Zack J., Ken J. C., Valentine R., and Arthur M. T., 2023). Fintech innovation involves applying digital technologies to disrupt and reshape traditional financial services (Schueffel, 2018). This includes a wide array of technological advancements such as artificial intelligence, big data, blockchain, and mobile applications. Fintech innovation not only introduces new technologies but also develops fresh business models, products, and services that improve customer experiences and meet previously unaddressed financial needs.

Innovation, broadly speaking, refers to the creation of a new or improved product or process (or a combination of both) that stands out from the entity's previous offerings and is either introduced to users (as a product) or adopted by the entity (Oslo Manual, 2018). In the realm of fintech, innovation entails the development and implementation of new technologies and strategies to address financial challenges, delivering more efficient and accessible financial services (Zavolokina L., Dolata M., & Schwabe G., 2016).

Fintech innovation began gaining significant traction in the early 2000s, with the rise of startups and companies aiming to disrupt traditional financial models (Mahmud K., Joarder Md. M. A., & Muheymin-Us-Sakib K., 2022). While financial innovation has a long history, the term "fintech" is used specifically to describe the modern wave of technology-driven advancements in the financial sector (Zavolokina L., Dolata M., & Schwabe G., 2016).

The emergence of fintech innovation can be attributed to several factors. First, the rapid development of digital technologies and the widespread use of the internet and mobile devices created fertile ground for the transformation of financial services. Second, consumers began to demand more convenient, efficient, and accessible financial solutions, areas where traditional institutions were often slow to respond. Third, regulatory changes like the Dodd-Frank Act in the United States and PSD2 in Europe played a critical role in encouraging competition and fostering innovation in the financial industry. Finally, entrepreneurs and startups identified the financial sector, often constrained by heavy regulation and inertia, as ripe for disruption and began exploring innovative solutions. These elements converged to create the dynamic fintech landscape we see today.

Several factors are fueling the rapid growth of fintech innovation. Technological progress and the increasing availability of digital infrastructure have provided a strong foundation for fintech startups to create and implement new solutions (Gomber et al., 2018). Changing customer expectations, with a growing demand for convenience, speed, and personalized

services, are also driving the adoption of fintech offerings (Bessis, 2017). Additionally, regulatory efforts such as open banking and sandbox environments have fostered a favorable climate for experimentation and collaboration between fintech companies and traditional financial institutions (Claessens et al., 2019).

The adoption and spread of fintech innovation are shaped by various factors. On an individual level, aspects such as perceived usefulness, ease of use, trust, and perceived risks influence consumer acceptance of fintech services (Davis, 1989). Organizational factors, including strategic alignment, available resources, and company culture, are also key in determining how traditional financial institutions adopt fintech (Tallon et al., 2013). Additionally, external factors like regulatory environments, market competition, and socioeconomic conditions affect the diffusion and scalability of fintech innovations (Serrano-Cinca et al., 2015).

Fintech innovation has wide-reaching effects on the financial industry, consumers, and society. It holds the potential to enhance financial inclusion by offering services to underserved populations and encouraging alternative lending methods (Hannig and Jansen, 2010). However, challenges such as data privacy, security issues, regulatory compliance, and the disruption of traditional financial institutions raise concerns that must be addressed (Claessens and Marques-Ibanez, 2018). Furthermore, the risk of unequal access and the

potential for widening the digital divide underscore the importance of ensuring that fintech innovation is inclusive and responsible (Hanna et al., 2021).

2.2.2 Levels of Fintech Innovation

In this section, we delve into the diverse Levels of Fintech Innovation, dissecting the key stages and milestones that mark the evolution of financial technology. This exploration aims to provide a comprehensive understanding of how Fintech has progressed, from foundational developments to cutting-edge advancements, shaping the financial industry's landscape at different strata of innovation.

Framework 1: The framework categorizes fintech innovation into three levels:

According to Schär F., Tobias B., and Gassmann O. (2018), the framework for categorizing the levels of fintech innovation in their research paper titled "A Conceptual Framework for FinTech Innovation." is stated below:

Level 1: Incremental innovation: This type of innovation involves making small improvements to existing financial products and services. For example, developing a new mobile app that makes it easier for customers to manage their finances would be considered incremental innovation.

Level 2: Radical innovation: This type of innovation involves creating new financial products and services that disrupt existing markets. For example, the development of blockchain technology and cryptocurrencies would be considered radical innovation.

Level 3: Transformational innovation: This type of innovation involves fundamentally changing the way that financial services are delivered. For example, the development of peer-to-peer lending platforms would be considered transformational innovation.

Framework 2: Process Enhancement and Efficiency Gains: At the first level, fintech innovation focuses on enhancing existing processes and improving efficiency within financial institutions. This involves the implementation of technologies such as robotic process automation (RPA), data analytics, and cloud computing to streamline operations, reduce costs, and improve accuracy (PwC, 2018), (Michael B. Imerman & Frank J. Fabozzi (2020)). For example, RPA can automate repetitive tasks in areas like customer onboarding, account reconciliation, and compliance reporting, enabling faster and error-free processes (Accenture, 2020).

- o Product Innovation and Digital Transformation: The second phase of fintech innovation focuses on creating new and cutting-edge financial products and services, primarily powered by digital technology. This includes the launch of mobile payment systems, peer-to-peer lending platforms, robo-advisors, and digital wallets (Deloitte, 2019). These

advancements are designed to improve the customer experience, boost accessibility, and meet the growing consumer demand for financial services that are convenient, tailored, and easy to use (World Economic Forum, 2020).

- o Disruptive Business Models and Marketplaces: At the third stage, fintech innovation transcends improving processes and products, instead transforming traditional business models and creating entirely new markets. This shift is driven by the rise of fintech startups and platforms that challenge established institutions and reshape the financial industry. Examples include crowdfunding platforms, decentralized finance (DeFi) protocols, and peer-to-peer lending networks (CBInsights, 2021). These innovations often rely on technologies like blockchain, smart contracts, and decentralized systems, allowing participants to interact directly and eliminating the need for intermediaries (Bansal et al., 2021).
- o Systemic Transformation and Ecosystem Integration: The fourth stage of fintech innovation involves a systemic transformation, where fintech solutions become embedded within the broader financial ecosystem. A key example is open banking, where traditional banks partner with fintech companies to share customer data via application programming interfaces (APIs) (European Commission, 2019). This approach encourages interoperability, drives innovation through collaboration, and gives customers greater control over their financial data (Finextra, 2021).

2.2.3 Importance of Fintech Innovation

Fintech innovation holds significant importance in shaping the future of the financial industry (Schär F., Tobias B., & Gassmann O. (2018).

Customer-focused: Fintech innovation plays a pivotal role in enhancing customer-centricity within the financial industry. By leveraging digital technologies and data analytics, fintech firms can deliver personalized and tailored financial products and services to meet the evolving needs of customers (Bessis, 2017). Through user-friendly interfaces, mobile applications, and advanced algorithms, fintech companies provide convenient, accessible, and intuitive financial experiences, empowering individuals and businesses to manage their finances more efficiently (World Economic Forum, 2020).

Financial Inclusion: Fintech innovation provides financial inclusion by reaching underserved populations and segments traditionally overlooked by traditional financial institutions (Hannig and Jansen, 2010). Fintech solutions enable individuals without access to traditional banking services to engage in financial transactions, such as digital payments and micro-lending, thereby bridging the gap of financial exclusion (Aitken et al., 2020). This inclusive approach helps foster economic growth, reduce poverty, and empower individuals with greater financial control and opportunities (Dewilde and Bazen, 2020).

Industry Transformation: Fintech innovation drives the transformation of the financial industry by challenging and reshaping traditional business models. Fintech startups and disruptive platforms introduce innovative approaches, leveraging technologies such as blockchain, artificial intelligence, and machine learning, to optimize processes, increase efficiency, and reduce costs (PwC, 2018). This transformation encourages established financial institutions to adapt and embrace technological advancements to remain competitive in the evolving landscape.

Collaboration and partnership: Fintech innovation fosters collaboration between fintech firms and traditional financial institutions. Through initiatives such as open banking, fintech companies and banks can collaborate, leveraging each other's strengths, and providing customers with comprehensive and integrated financial solutions (European Commission, 2019). This collaboration stimulates innovation, encourages knowledge sharing, and creates opportunities for mutual growth and expansion.

Addressing Societal Challenges: Fintech innovation is further amplified by its potential to address societal challenges and promote sustainable development. Fintech solutions can facilitate responsible investing, support green finance initiatives, and enable efficient resource allocation (Allen et al., 2020). By leveraging technology and data, fintech innovation can contribute to addressing social and environmental challenges, making the financial industry a driver of positive change.

2.2.4 Fintech Innovation in Nigeria

Fintech innovation in Nigeria can be traced back to the early 1990s with the introduction of automated teller machines (ATMs) and electronic point-of-sale (POS) terminals. However, the real boom in fintech innovation began in the early 2000s with the launch of mobile money services.

In 2009, MTN Nigeria launched MTN Mobile Money, which quickly became the most popular mobile money service in the country. MTN Mobile Money allowed Nigerians to send and receive money, pay bills, and purchase goods and services using their mobile phones (Abdur R. A. S. Africanews (2019)). The service has since evolved, and in 2022, MTN received final approval to launch a payment service bank in Nigeria, further expanding its financial services offerings (Paula Gilbert, ConnectingAfrica (2022)). As of 2023, MTN's Mobile Money service, also known as MoMo, has attracted around 9.4 million users in Nigeria, demonstrating the population's willingness to embrace digital financial services (ThePaypers (2022)). However, despite its significant user base, the service is still working on reaching more Nigerians and increasing its adoption across the country (TechCabal (2023)). Additionally, the launch of MTN MoMo bank in Nigeria in 2022 further exemplifies MTN's continued expansion and investment in its financial services operations (Matshepo Sehloho, ConnectingAfrica (2022)).

The success of MTN Mobile Money paved the way for other fintech startups to emerge in Nigeria. In 2011, Interswitch launched Verve, a domestic debit card network. In 2013, Flutterwave launched a payment gateway that allowed Nigerian businesses to accept online payments.

In recent years, there has been a surge in fintech innovation in Nigeria. This has been driven by several factors, including the growing adoption of smartphones and the internet, the large and youthful population, and the supportive regulatory environment.

Fintech innovation in Nigeria has grown over time in several ways:

Expansion of product and service offerings: Fintech startups are now offering a wide range of products and services, including mobile banking, mobile money transfer, online payment processing, micro-lending, and investment platforms.

Increase in funding: Fintech startups in Nigeria have attracted significant funding from both local and international investors. This has allowed them to scale their businesses and launch new products and services.

Growing adoption by consumers and businesses: Fintech products and services are becoming increasingly popular among consumers and businesses in Nigeria. This is due to the convenience, affordability, and accessibility of these products and services.

Some examples of fintech innovation in Nigeria include:

Mobile banking: Mobile banking apps allow Nigerians to access their bank accounts and make payments from their smartphones. This is particularly convenient for people living in rural areas where access to traditional banking services is limited.

Mobile money transfer: Mobile money transfer services allow Nigerians to send and receive money quickly and easily using their smartphones. This has been a game-changer for many Nigerians, especially those who rely on remittances from family and friends living abroad.

Online payment processing: Online payment processing gateways allow Nigerian businesses to accept online payments from customers around the world. This has made it easier for Nigerian businesses to participate in the global economy.

Micro-lending: Micro-lending platforms allow Nigerians to access small loans without having to go through a traditional bank. This has been a lifeline for many Nigerians who need access to credit to start or grow their businesses.

Investment platforms: Investment platforms allow Nigerians to invest in stocks, bonds, and other financial assets. This has made it easier for Nigerians to save for the future and build wealth.

2.2.5. Fintech Innovation Initiatives in Nigeria

Fintech innovation is having a positive impact on the Nigerian economy by increasing financial inclusion, promoting economic growth, and creating jobs.

Fintech innovation in Nigeria has gained significant momentum in recent years, transforming the financial landscape and driving financial inclusion in the country. With a rapidly growing population and increasing smartphone penetration, Nigeria presents a fertile ground for fintech startups to flourish (EFInA, 2020).

The advent of innovative lending platforms has addressed the credit gap in Nigeria's financial system. Fintech companies like Renmoney, and Paylater (now known as Carbon) have leveraged technology and alternative data sources to offer quick and accessible loans to individuals and small businesses (CBN, 2020). The Central Bank of Nigeria reports that the value of consumer loans granted by fintech platforms exceeded 380 billion Naira in 2020, providing critical financing opportunities to underserved segments (CBN, 2021). This data-driven lending approach has not only expanded access to credit but also fostered financial inclusion and economic growth.

Fintech innovation in Nigeria is fueling the growth of digital banking services. With traditional brick-and-mortar banking services facing challenges in reaching the unbanked population, fintech firms are leveraging technology to offer digital banking solutions. For

instance, Kuda Bank, a digital-only bank, has gained significant traction with its mobile banking app, attracting over 1.4 million users as of 2021 (Disrupt Africa, 2021). This shift towards digital banking is evident in the data, with the number of bank accounts opened through digital channels increasing by 37% in 2020 (NIBSS, 2021). This demonstrates the changing consumer behaviour and the demand for convenient and accessible banking services provided by fintech firms.

Nigeria has one of the fastest-growing smartphone markets in the world, with over 130 million smartphone users in 2023. This represents a significant growth from just over 100 million users in 2022. Similarly, internet penetration in Nigeria has grown rapidly in recent years, reaching over 54% of the population in 2023. (The Economist Intelligence Unit Limited (2020).

The widespread adoption of smartphones and the internet has created a fertile ground for fintech innovation in Nigeria. Fintech startups are leveraging these technologies to develop new and innovative financial services that are accessible to a wider range of people than ever before.

For example, mobile banking apps allow Nigerians to access their bank accounts and make payments from their smartphones. This is particularly convenient for people living in rural areas where access to traditional banking services is limited.

Similarly, mobile money transfer services allow Nigerians to send and receive money quickly and easily using their smartphones. This has been a game-changer for many Nigerians, especially those who rely on remittances from family and friends living abroad.

Nigeria has a large and youthful population, with over 60% of the population under the age of 30. This demographic dividend is a key driver of fintech innovation in Nigeria.

Young Nigerians are more likely to be early adopters of new technologies, and they are also more likely to be interested in innovative financial services. For example, a recent survey found that 70% of young Nigerians are interested in using cryptocurrencies.

Fintech startups are targeting this young and tech-savvy demographic with innovative financial services that meet their unique needs. For example, some fintech startups are offering micro-loans to young entrepreneurs who may not be able to qualify for traditional loans from banks.

Other fintech startups are offering investment platforms that allow young Nigerians to invest in stocks and other financial assets.

Nigeria has witnessed several initiatives aimed at promoting fintech innovation and fostering the growth of the sector. These initiatives have played a crucial role in creating an enabling environment for fintech startups and driving financial inclusion. This section highlights key fintech innovation initiatives in Nigeria.

- o Regulatory Sandboxes: The Central Bank of Nigeria (CBN) launched regulatory sandboxes to create a controlled space for fintech firms to test new products and services. These sandboxes enable fintech startups to experiment with emerging technologies and innovative business models while maintaining a focus on consumer protection and regulatory adherence (CBN, 2020). By lowering regulatory hurdles and encouraging cooperation between regulators and fintech companies, this initiative supports the growth of innovation.

- o Financial Inclusion Initiatives: The Nigerian government, working alongside various stakeholders, has introduced several initiatives aimed at boosting financial inclusion through fintech innovation. A key initiative is the Nigeria Financial Inclusion Strategy, which seeks to lower the number of financially excluded individuals and improve access to affordable financial services (CBN, 2018). Fintech startups have been instrumental in driving this progress by utilizing mobile technology, agent banking, and digital payment solutions to serve underserved communities.

- o Collaborative Ecosystems: Fintech hubs and innovation centres have emerged in Nigeria, fostering collaboration, knowledge sharing, and entrepreneurship in the fintech space. Fintech hubs and innovation centres are playing an increasingly important role in the development of the Nigerian fintech ecosystem. These hubs provide a space for fintech

startups, investors, and other stakeholders to come together, collaborate, and share knowledge.

According to the Fintech Association of Nigeria, 2022, there are over 20 fintech hubs in Nigeria. This number is growing rapidly as the fintech ecosystem continues to develop. (Fintech Association of Nigeria: <https://fintechng.org/>)

Some of the most prominent fintech hubs and innovation centres in Nigeria include: Fintech Sandbox (Lagos), Edo Innovation Hub (Benin), Co-Creation Hub (Lagos and Yaba), Nigeria Fintech Hub (Lagos), Ventures Platform (Abuja), Leadway Accelerator (Lagos), Techstars Nigeria (Lagos), L5Lab (Lagos), Plug and Play Africa (Lagos), Future Africa (Lagos), CcHub Design Lab (Lagos), HNG Internship (Lagos), Andela (Lagos and other locations). These hubs offer a variety of programs and services to support fintech startups, including co-working space, mentorship, networking opportunities, access to investors, and educational programs.

- **Fintech Funding Initiatives:** Recognizing the importance of funding for fintech startups, various initiatives have been introduced to provide financial support to early-stage ventures. For example, the Fintech Fund, managed by the Nigerian government, provides equity funding to fintech startups through the Bank of Industry. Additionally, private investment firms and venture capitalists have shown increasing interest in funding

Nigerian fintech startups, contributing to the growth and sustainability of the sector. Nigerian fintechs raised approximately \$600 million in funding from 2014 to 2020, with 2019 alone accounting for \$122 million of this total. In 2021, Nigerian fintech startups raised a total of USD 536,655,000, which accounted for 59% of the total amount raised by all startups in the same period. Between 2016 and 2022, offshore investments in Nigerian fintech companies totalled over \$876.5 million. In 2022, Nigeria's fintech sector attracted \$798 million in funding, up from \$1.3 billion in 2021 (Businessday, 2023).

- **Regulatory Framework Enhancements:** The regulatory framework for fintech in Nigeria has seen substantial improvements to foster innovation while maintaining consumer protection and financial stability. The Central Bank of Nigeria (CBN) has introduced various guidelines and regulations tailored to fintech activities, including mobile money, payment systems, and agent banking (CBN, 2020). These regulations offer clarity and establish a fair environment for fintech startups, building trust with both investors and consumers.
- In August 2020, the CBN introduced guidelines for licensing and regulating payment service banks. Then, in February 2021, the CBN issued a circular prohibiting banks and financial institutions from managing accounts for cryptocurrency service providers. Most recently, in June 2023, the CBN released the Central Bank of Nigeria (Customer Due

Diligence) Regulations, 2023, aimed at helping banks and financial institutions implement and adhere to customer due diligence requirements (CBN, 2023).

2.3 Blockchain

Blockchain technology represents a transformative digital ledger system designed to securely store and manage transaction data. Essentially, a blockchain is a digital database that organizes information into blocks, each containing transaction details and a reference to the preceding block. This structure forms a chain of blocks, creating an immutable and transparent record of all transactions (Don & Alex Tapscott, 2016).

As a distributed ledger technology (DLT), blockchain operates by duplicating and sharing a digital ledger across a network of computers. Each block in the chain is cryptographically linked to its neighbors, ensuring the integrity and security of the data (Gartner, 2020). This design eliminates the need for a central authority, offering a decentralized approach to record-keeping that enhances trust and transparency without relying on intermediaries (Don & Alex Tapscott, 2017).

Blockchains are particularly renowned for their role in supporting cryptocurrencies by maintaining a decentralized and secure record of financial transactions. The technology's core strengths include immutability, which means once a transaction is entered into the blockchain, it cannot be altered or erased. This feature makes blockchain highly suitable for

recording critical documents like contracts and property deeds (World Economic Forum, 2020).

Additionally, blockchain's transparency and traceability provide valuable benefits, especially in supply chain management. By allowing all network participants to view the transaction history, blockchain fosters greater transparency and reduces the likelihood of fraud (Yli-Huumo et al., 2016). Its decentralized nature means it is maintained by a global network of computers, making it resistant to tampering and hacking.

As blockchain technology continues to evolve, its applications are expanding beyond cryptocurrencies to include areas such as smart contracts and supply chain tracking. Organizations and policymakers must carefully explore and implement blockchain solutions to maximize their benefits while ensuring their responsible integration into existing systems.

2.3.1 Historical Perspective of Blockchain Development

The concept of a blockchain was first described in a white paper published by Satoshi Nakamoto in 2008. Nakamoto proposed using a blockchain to create a new digital currency called Bitcoin.

The first Bitcoin blockchain was launched in 2009, and it has been running continuously ever since. Since then, blockchain technology has evolved rapidly and has been used to create a wide range of new applications.

- o 2008: Satoshi Nakamoto publishes a white paper describing the concept of a blockchain.
- o 2009: The first Bitcoin blockchain is launched.
- o 2013: Ethereum is launched, providing a platform for developers to build decentralized applications (DApps) on blockchain technology.
- o 2014: The Hyperledger project is launched to develop open-source blockchain technologies for businesses.
- o 2015: The Enterprise Ethereum Alliance (EEA) is formed to promote the adoption of Ethereum in the enterprise sector.
- o 2017: The initial coin offering (ICO) boom sees billions of dollars raised for blockchain-based projects.
- o 2018: The cryptocurrency market collapses, but blockchain development continues to grow.
- o 2021: The non-fungible token (NFT) market booms, bringing blockchain technology to the attention of a wider audience.

2.3.2 Blockchain Application

Blockchain technology, while still evolving, has already made a significant impact across various sectors, including financial services, supply chain management, voting systems, healthcare, and government operations. Its decentralized, immutable, and transparent characteristics make it well-suited for these diverse applications.

At its core, blockchain operates through a distributed network of computers, or nodes, that collaboratively manage and verify a shared ledger. Each block in the chain is cryptographically linked to its predecessor, creating a secure and unchangeable record of transactions. This structure ensures that the data is both accurate and accountable, eliminating the need for intermediaries such as banks or clearinghouses, as the network participants themselves validate and confirm transactions.

In the realm of digital currencies, blockchain technology has revolutionized the way assets are transferred. Bitcoin, the most prominent example, leverages blockchain to enable secure, decentralized exchanges of digital assets without relying on traditional financial intermediaries. Cryptocurrencies, built on this technology, facilitate peer-to-peer transactions, granting users more control over their financial dealings and reducing dependence on centralized financial institutions (Swan, 2015).

2.3.3 Blockchain Ecosystem

The blockchain ecosystem represents a complex and interconnected network of stakeholders, technologies, and platforms that collectively contribute to the development, adoption, and growth of blockchain technology. It encompasses a diverse range of participants, each playing a unique role in shaping the ecosystem and driving innovation forward.

Developers: At the core of the blockchain ecosystem are the developers and innovators who drive the technical advancements of blockchain technology. They contribute to the design and development of blockchain protocols, smart contracts, decentralized applications (DApps), and other innovative solutions (Tapscott & Tapscott, 2016). Open-source communities, such as Ethereum and Hyperledger, provide platforms for developers to collaborate, share ideas, and contribute to the evolution of blockchain technology.

Platforms and Protocols: Blockchain platforms and protocols form another crucial component of the ecosystem. These platforms serve as the foundation for building and deploying blockchain applications. Prominent examples include Ethereum, Hyperledger Fabric, and Ripple. They provide developers with tools, APIs, and infrastructure to create decentralized solutions across various industries (Swan, 2015).

Users and Participants are integral to the blockchain ecosystem, as they interact with blockchain applications and platforms. These users can be individuals, businesses, or organizations that leverage blockchain technology for various purposes, such as conducting transactions, creating digital identities, or utilizing decentralized services. Their engagement and adoption of blockchain solutions drive the growth and utility of the ecosystem.

Network nodes and Validators contribute to the decentralized nature of blockchain technology. These nodes store copies of the blockchain and participate in the consensus

mechanism to validate and verify transactions. Consensus mechanisms, such as Proof-of-Work (PoW) and Proof-of-Stake (PoS), ensure the integrity and security of the blockchain (Nakamoto, 2008).

Industry Consortia and Alliances play a vital role in fostering collaboration and innovation within specific sectors. Examples include the Enterprise Ethereum Alliance (EEA) and the Blockchain in Transport Alliance (BiTA). These consortia bring together organizations and stakeholders from targeted domains to establish industry-specific standards, conduct research, and collaborate on blockchain initiatives (Swan, 2015).

Regulation and Governments also influence the blockchain ecosystem through the establishment of policies and legal frameworks. They address concerns related to compliance, consumer protection, and security while providing clarity and guidelines for blockchain innovation. Regulatory frameworks can encourage responsible blockchain adoption and ensure the proper functioning of the ecosystem (Tapscott, 2016).

The blockchain ecosystem thrives on collaboration, innovation, and interoperability among its diverse components. It fosters the creation of diverse blockchain applications, promotes industry-specific standards, and drives the adoption of this transformative technology across sectors.

2.3.4 Blockchain in Nigeria

In recent years, Nigeria has emerged as a leading hub for blockchain technology adoption and innovation in Africa. The potential of blockchain to address various socioeconomic challenges has captured the attention of entrepreneurs, developers, and policymakers in the country.

Blockchain technology has found applications in various sectors in Nigeria. One prominent area is finance and payments, where blockchain solutions offer faster, more secure, and cost-effective alternatives to traditional systems. For instance, startups like SureRemit and BitPesa leverage blockchain to facilitate remittances and cross-border transactions, enabling greater financial inclusion and efficiency (Iyamu & Ayo, 2021).

Another area where blockchain is making significant strides in Nigeria is supply chain management. The country's agricultural sector, for example, has seen the implementation of blockchain solutions to enhance transparency and traceability. By leveraging blockchain's immutability and decentralized nature, stakeholders can track the journey of agricultural products, reducing fraud, ensuring quality, and promoting trust (Adewale et al., 2020).

To foster blockchain innovation, Nigeria has witnessed the emergence of numerous initiatives and organizations. For instance, the Blockchain Nigeria User Group (BNUG) promotes blockchain education, awareness, and collaboration among stakeholders. The

government has also shown interest in blockchain technology and its potential impact. The National Information Technology Development Agency (NITDA) has established guidelines and frameworks to regulate and encourage blockchain adoption in various sectors (NITDA, 2019).

The Central Bank of Nigeria (CBN) has shown support for blockchain technology. In 2021, the CBN announced plans to launch a digital currency, which is being built on blockchain technology. This initiative aims to promote financial inclusion, enhance efficiency, and reduce the cost of financial transactions in the country (CBN, 2021).

While blockchain adoption in Nigeria shows promise, challenges remain. Limited awareness and understanding of blockchain technology among the general population and regulatory authorities pose hurdles to its widespread adoption. Additionally, infrastructure limitations, such as internet connectivity and access to reliable power supply, need to be addressed to fully harness the potential of blockchain technology in the country (Iyamu & Ayo, 2021).

2.3.4.1 Blockchain Regulation in Nigeria

The bodies regulating blockchain in Nigeria include the Central Bank of Nigeria (CBN), the Securities and Exchange Commission (SEC), the Nigerian Communications Commission (NCC), the National Information Technology Development Agency (NITDA), Nigerian

Deposit Insurance Corporation (NDIC), the Economic and Financial Crimes Commission (EFCC) depending on the specific application of blockchain.

As blockchain technology gains traction in Nigeria, regulators have been actively involved in shaping the legal and regulatory landscape to promote responsible and secure blockchain adoption. This section provides an overview of blockchain regulation in Nigeria, highlighting the government's stance, key initiatives, and the potential impact on the blockchain ecosystem.

The CBN has approved a national blockchain policy as part of its efforts to transition to a digital economy. The CBN has been actively monitoring and regulating cryptocurrencies. In February 2021, the CBN issued a circular directing financial institutions to close accounts associated with cryptocurrency exchanges. This directive aimed to mitigate the risks associated with cryptocurrencies, such as money laundering and terrorism financing. However, it is worth noting that the CBN has shown interest in exploring the potential of central bank digital currencies (CBDCs) built on blockchain technology (CBN, 2021).

- o Circular on Operations of Bank Accounts for Virtual Assets Service Providers (VASPs) (2023): This circular lays out guidelines for financial institutions interacting with VASPs (including crypto exchanges and wallet providers), aiming to mitigate risks and ensure adherence to AML/CFT regulations.

- o Central Bank Digital Currency (CBDC) Project: The CBN is exploring the development of a CBDC, which would be a digital version of the Nigerian Naira issued and controlled by the bank.

The SEC has also begun to consider cryptocurrency regulation and has published a comprehensive 54-page document titled "New Rules on Offering Platforms and Custody of Digital Assets," which details guidelines for cryptocurrency service providers in Nigeria. These regulatory efforts indicate a growing focus on blockchain and cryptocurrency regulation in Nigeria. SEC of Nigeria stated in 2020 classifying cryptocurrencies as securities, subjecting them to regulation under existing securities laws. This move aims to protect investors and prevent fraudulent activities while allowing for legitimate cryptocurrency operations in the country (SEC Nigeria, 2020).

- o Rules on Issuance, Offering Platforms and Custody of Digital Assets (2022): These rules establish a framework for regulating the issuance and offering of tokens considered securities, including registration requirements, investor protection measures, and anti-money laundering/counter-terrorism financing (AML/CFT) compliance.
- o Concept Paper on Regulatory Framework for Digital Assets (2022): This paper outlines the SEC's initial thoughts on a comprehensive regulatory framework for digital assets, including non-security tokens and platforms.

NCC: Regulates the telecommunications sector and has shown interest in blockchain's potential applications for mobile money and identity management.

- o Draft Policy on Blockchain Technology for the Telecom Sector (2020): This draft policy outlines NCC's plans to promote the use of blockchain technology in telecommunications, particularly for mobile money and identity management. However, it's not yet finalized.

NITDA: Responsible for developing and implementing Nigeria's IT policy and promoting the responsible use of technology. NITDA is exploring the use of blockchain for e-government services and data security. The government of Nigeria recognizes the transformative potential of blockchain technology and has taken steps to provide regulatory clarity and guidelines. The National Information Technology Development Agency (NITDA) has played a pivotal role in formulating the Nigeria Blockchain Adoption Strategy. This strategy aims to establish a conducive environment for blockchain innovation while addressing potential risks and ensuring compliance with existing regulations (NITDA, 2019).

- o National Blockchain Adoption Strategy (2023): This strategy outlines NITDA's vision for blockchain adoption in Nigeria, focusing on areas like e-government, healthcare, and supply chain management. However, it doesn't include specific regulatory guidelines.

While regulatory efforts aim to strike a balance between fostering innovation and mitigating risks, challenges remain. The evolving nature of blockchain technology and its global nature present difficulties in establishing uniform regulations. Additionally, the lack of widespread awareness and understanding of blockchain among regulators and the general public poses challenges in formulating effective and comprehensive regulatory frameworks (Iyamu & Ayo, 2021).

Overall, the lack of uniform blockchain regulation in Nigeria has both positive and negative aspects. On the one hand, it gives startups the flexibility to innovate and grow. On the other hand, it creates uncertainty and risk for businesses, investors, and consumers.

2.3.5 Blockchain and Fintech Innovation

Blockchain technology has the potential to revolutionize the fintech industry. Blockchain can be used to create new and innovative financial products and services, such as decentralized exchanges and peer-to-peer lending platforms. Blockchain can also be used to improve the efficiency and security of existing financial services. Some specific examples of how blockchain is being used to drive fintech innovation are Decentralized exchanges (DEXs) are peer-to-peer exchanges that allow users to trade cryptocurrencies without the need for a central intermediary. This makes DEXs more secure and less expensive than traditional centralized exchanges. Peer-to-peer lending platforms (P2P) allow users to borrow and lend money directly to each other, without the need for a bank. This can be a more affordable and

efficient way to borrow and lend money than traditional banking products. Smart contracts are self-executing contracts that are stored on a blockchain. Smart contracts can be used to automate a wide range of financial transactions, such as payments, insurance claims, and settlements. Central bank digital currencies (CBDCs) are digital currencies that are issued and regulated by central banks. CBDCs have the potential to revolutionize the way that payments are made, and could also be used to implement new monetary policy tools.

2.4 Theoretical Review

- o **Diffusion of innovation theory:** This theory explains how new ideas and technologies are adopted by individuals and organizations over time. It posits that there are five stages of adoption: awareness, interest, evaluation, trial, and adoption. Fintech innovations and blockchain are still in the early stages of diffusion, but they are gaining traction rapidly. The diffusion of innovation theory suggests that fintech innovations and blockchain are likely to be adopted by more and more individuals and organizations over time. This is because they offer several advantages over traditional financial products and services, such as greater convenience, affordability, and transparency. (Evelyn N., Barney T., Yuan S., & Tian M. (2022).
- o **Disruptive innovation theory:** This theory explains how new technologies disrupt existing markets and industries. It posits that disruptive technologies are typically simpler, cheaper, and more convenient than the incumbent technologies. Fintech

innovations and blockchain have the potential to disrupt the financial industry by offering new and innovative products and services that are more accessible and affordable to consumers. The disruptive innovation theory suggests that fintech innovations and blockchain have the potential to disrupt the financial industry by offering new and innovative products and services that are more accessible and affordable to consumers. For example, fintech innovations such as mobile banking and peer-to-peer lending platforms are making it easier for people in developing countries to access financial services. (Evelyn N., Barney T., Yuan S., & Tian M. (2022).

- o **Platform theory:** This theory explains how platforms create value by enabling interactions between different groups of users. Fintech innovations and blockchain can be seen as platforms that enable new financial products and services to be developed and offered to consumers. The platform theory suggests that fintech innovations and blockchain can be used to create platforms that enable new financial products and services to be developed and offered to consumers. For example, the Ethereum blockchain platform has enabled the development of a wide range of decentralized applications (DApps), including decentralized exchanges and peer-to-peer lending platforms (Evelyn N., Barney T., Yuan S., & Tian M. (2022).

2.4.1 Technology Acceptance Model

The Technology Acceptance Model (TAM) was created by Davis (1985, cited in Chuang, Liu, & Kao, 2015), to clarify the variables that decide users' appropriation and utilization of modern innovation. In the context of Fintech Innovation, The Technology Acceptance Model (TAM) is a widely recognized framework that explains users' acceptance and adoption of new technologies. When applied to the context of fintech innovation, TAM provides valuable insights into the factors that influence the adoption and usage of fintech services. This section explores TAM in the context of fintech innovation and its relevance in understanding users' behaviour and acceptance of fintech solutions.

TAM posits that users' acceptance of technology is primarily determined by two key factors: perceived usefulness and perceived ease of use (Davis, 1989, Baptista & Oliveira, 2015). Subjective norms, social influence, and trust in shaping users' acceptance of fintech innovation. Positive feedback and recommendations from friends, family, or influential individuals can influence users' intentions to adopt fintech solutions (Chau & Hu, 2002). Trust plays a crucial role in users' acceptance of fintech services (Siau & Shen, 2003).

Understanding users' perceptions and attitudes towards fintech innovation through the lens of TAM can help fintech providers and policymakers identify key drivers and barriers to adoption. By addressing users' concerns and enhancing perceived usefulness, ease of use, and trust, fintech companies can increase the likelihood of successful adoption and usage of their innovations.

CHAPTER THREE

METHODOLOGY

3.1 Introduction:

This chapter outlines the research methodology employed to investigate the impact of blockchain technology on fintech innovation within selected firms in Nigeria. The research design, data collection methods, data analysis techniques, and the selection of participants will be discussed in detail.

3.2 Research Design:

The study adopts a mixed-methods research design such as Questionnaire and Interviews to gain a comprehensive understanding of the subject matter. The combination of qualitative and quantitative approaches allows for triangulation and enhances the reliability and validity of the findings. The research aims to understand the research problems. It allows the researcher to gain a deeper understanding of the research problems.

3.2.1 Source of Data:

The area of study is Nigeria, with data from experts across the globe working in the fintech industry.

3.3 Sampling Technique:

The study employs purposive sampling to select firms in Nigeria known for their active involvement in both blockchain technology and fintech innovation. A diverse range of firms

from various sectors, such as banking, finance, and technology, will be considered to ensure a well-rounded perspective. The sample size of the study consists of a Hundred and Ten responses (110). 100 responses on the survey and questionnaire, then 10 responses from the interview. The technique relies on using a random selection method that provides each participant with an equal chance of being selected, giving each participant the same probability of being selected.

3.4 Operational and Measurement Variables:

3.4.1 Operational Variables:

1. Adoption of Blockchain Technology: This variable will assess the extent to which selected firms in Nigeria have integrated blockchain technology into their operations. It can be operationalized as a binary variable (adopted vs. not adopted) or on a scale to represent the degree of adoption (low, medium, high).
2. Fintech Innovation: This variable measures the level of innovation in the firms' fintech services and products. It can be operationalized using metrics such as the number of new fintech products launched, the percentage of revenue generated from fintech offerings, or innovation indices.
3. Impact on Efficiency: This variable evaluates the effect of blockchain integration on the operational efficiency of the firms. Operational efficiency can be measured by comparing

key performance indicators before and after blockchain implementation, such as transaction processing time or cost savings.

3.4.2 Measurement Variables:

Survey Questions: To measure the adoption of blockchain technology and fintech innovation, Likert-scale questions can be utilized.

3.4.3 Data Collection:

Primary Data:

Surveys: A structured questionnaire will be administered to employees and executives of the selected firms to gather quantitative data on their adoption of blockchain technology and its impact on fintech innovation.

Secondary Data:

Relevant data from industry reports, academic journals, and government publications will be reviewed to support and contextualize the findings.

3.4.4 Data Analysis:

Quantitative data obtained from the surveys will be analyzed using statistical software, such as SPSS, to derive descriptive statistics, correlations, and regression analysis. The qualitative data from interviews will undergo thematic analysis to identify patterns and themes related to blockchain and fintech innovation.

3.4.5 Ethical Considerations:

To ensure ethical practices, informed consent will be obtained from all participants before their involvement in the study. Confidentiality and anonymity will be guaranteed, and data will be securely stored and used solely for research purposes.

3.4.6 Limitations in the Research Process:

1. **Limited Access to Data:** The study might face challenges in obtaining access to sensitive company data, particularly when investigating financial metrics and proprietary information related to blockchain integration and fintech innovations.

2. **Sample Size and Representation:** The sample of selected firms may not fully represent the entire population of firms engaged in blockchain and fintech activities in Nigeria. This limitation can affect the generalizability of the findings.

3. **Self-reporting Bias:** The data collected through surveys and interviews may be subject to self-reporting bias, where respondents may provide socially desirable answers or over/under-report their actual adoption and innovation levels.

4. **Time Constraints:** Researching the impact of blockchain and fintech on firms' operations might require an extended period, but as a final-year student, there might be time limitations, potentially affecting the depth and breadth of the study.

5. **Selection Bias:** Purposive sampling might introduce selection bias, as the choice of firms may be influenced by preconceived notions or accessibility rather than random selection.

6. Causation vs. Correlation: Establishing a causal relationship between blockchain adoption and fintech innovation could be challenging, as other external factors may influence these variables simultaneously.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter presents the results, analysis and the interpretation of the results. The chapter ends by discussing the results with other literature reviewed

4.1 Demographics of Respondents

Table 4.1: Gender of Respondents

Gender	Frequency	Percentage (%)
Male	71	71.0
Female	29	29.0
Total	100	100.0

Table 4.1 presents the gender distribution of respondents involved in the study on blockchain technology as a driving fintech innovation in Nigeria. It shows that out of a total of 100 participants, 71 are male, representing 71% of the sample, while 29 are female, accounting for 29% of the sample. This indicates that the majority of the respondents are male, with males comprising more than two-thirds of the study population, while females make up less than one-third.

Table 4.2: Age Distribution of Respondents

Age	Frequency	Percentage (%)
Below 21 years	22	22.0
21-30 years	51	51.0
31-40 years	15	15.0
41-50 years	9	9.0
51 years and above	3	3.0
Total	100	100.0

Table 4.2 provides an age distribution of respondents in the study on blockchain technology as a driving fintech innovation in Nigeria. It reveals that the majority of participants, 51%, fall within the 21-30 age range, making this the most represented age group. Respondents below 21 years account for 22% of the sample, while those aged 31-40 years comprise 15%. Participants aged 41-50 years represent 9% of the total, and those 51 years and above constitute the smallest group at 3%.

Table 4.3: Marital Status of Respondents

Marital Status	Frequency	Percentage (%)
Single	42	42.0
Married	55	55.0
Divorced	3	3.0
Total	100	100.0

Table 4.3 displays the marital status distribution of respondents in the study on blockchain technology as a driving fintech innovation in Nigeria. It indicates that the majority of participants, 55%, are married, while 42% are single. A small fraction of the respondents, 3%, are divorced.

Table 4.4: Educational Qualification of Respondents

Educational Qualification	Frequency	Percentage (%)
WAEC/GCE/NECO	17	17.0
HND/BSC	52	52.0
Postgraduate	31	31.0
Total	100	100.0

Table 4.4 outlines the educational qualifications of respondents in the study on blockchain technology as a driving fintech innovation in Nigeria. It shows that a majority, 52%, possess an HND/BSc, indicating that more than half of the participants have obtained a higher education degree. Those with postgraduate qualifications make up 31% of the sample, suggesting a significant portion of respondents have advanced degrees. Meanwhile, 17% of the participants have qualifications at the level of WAEC/GCE/NECO.

Table 4.5: Years of Working Experience

Years of Working Experience	Frequency	Percentage (%)
Less than a year	23	23.0
1-3 years	46	46.0
4-6 years	24	24.0
7 years and above	7	7.0
Total	100	100.0

Table 4.5 presents the distribution of respondents' years of working experience in the study on blockchain technology as a driving fintech innovation in Nigeria. It shows that the largest group, 46%, has 1-3 years of working experience. Those with less than a year of experience make up 23% of the sample, while 24% of respondents have 4-6 years of

experience. The smallest group, comprising 7% of the participants, has 7 years or more of working experience.

4.2 Interpreting the Data

Research Question 1: What are the key use cases of blockchain technology in Fintech firms?

Table 4.6: Mean and standard deviation of respondents on the key use cases of blockchain technology in Fintech firms.

S/N	Questionnaire Items	N	SA	A	D	SD	Mean	Standard Deviation	Decision
6	Cryptocurrency transactions	100 100%	63 (63.0%)	37 (37.0%)	- (0.0%)	- (0.0%)	3.63	.513	Agree
7	Cross-border payments and remittances	100 100%	52 (52.0%)	42 (42.0%)	6 (6.0%)	- (0.0%)	3.46	.321	Agree
8	Smart contracts	100 100%	71 (71.0%)	29 (29.0%)	- (0.0%)	- (0.0%)	3.71	.202	Agree
9	Fraud reduction and security	100 100%	61 (61.0%)	39 (39.0%)	- (0.0%)	- (0.0%)	3.61	.404	Agree
10	Decentralized finance (DeFi)	100 100%	84 (84.0%)	16 (16.0%)	- (0.0%)	- (0.0%)	3.84	.216	Agree
11	Tokenization of Assets	100 100%	77 (77.0%)	23 (23.0%)	- (0.0%)	- (0.0%)	3.77	.321	Agree
12	Identity Verification and KYC	100 100%	92 (92.0%)	8 (8.0%)	- (0.0%)	- (0.0%)	3.92	.390	Agree
	Cluster Mean						3.7057		

Source: Fieldwork, 2024

The table provides insights into the perceived importance of various use cases of blockchain technology within fintech firms, based on respondents' ratings. Each use case, such as cryptocurrency transactions, smart contracts, and decentralized finance (DeFi), received high mean scores ranging from 3.46 to 3.92, indicating generally positive attitudes towards these applications. Specifically, smart contracts and identity verification/KYC garnered the highest mean ratings of 3.71 and 3.92, respectively, suggesting these are highly valued functionalities. Cross-border payments and remittances, although also positively rated with a mean of 3.46, showed a slightly wider distribution of opinions, reflected by a standard deviation of 0.321.

The cluster mean of 3.7057 indicates a generally favourable perception among respondents towards the key use cases of blockchain technology in fintech firms. The high mean scores observed across most categories reflect a strong agreement on the potential benefits of blockchain in enhancing transaction security, and operational efficiency through smart contracts, and expanding financial inclusion via decentralized finance initiatives.

Research Question 2: What are the benefits of using blockchain technology in Fintech firms?

Table 4.7: Mean and standard deviation of respondents on the benefits of using blockchain technology in Fintech firms

S/N	Questionnaire Items	N	SA	A	D	SD	Mean	Standard Deviation	Decision
13	Blockchain increases transparency by recording all transactions on a public ledger, making them visible and verifiable	100 100%	58 (58.0%)	38 (38.0%)	2 (2.0%)	2 (2.0%)	3.52	0.234	Agree
14	Blockchain reduces costs by eliminating intermediaries, thereby lowering transaction and operational expenses	100 100%	62 (62.0%)	30 (30.0%)	5 (5.0%)	3 (3.0%)	3.51	0.364	Agree
15	It provides greater accessibility by offering financial services to unbanked and underbanked populations	100 100%	73 (73.0%)	27 (27.0%)	- (0.0%)	- (0.0%)	3.73	0.381	Agree
16	Blockchain improves efficiency through the automation of processes with smart contracts, reducing manual intervention and error	100 100%	68 (68.0%)	32 (32.0%)	- (0.0%)	- (0.0%)	3.68	0.402	Agree
17	It reduces the risk of fraud due to its decentralized and transparent nature	100 100%	42 (42.0%)	38 (38.0%)	14 (14.0%)	6 (6.0%)	3.16	0.295	Agree
18	It speeds up transactions, often enabling real-time processing and settlement	100 100%	64 (64.0%)	31 (31.0%)	4 (4.0%)	1 (1.0)	3.58	0.301	Agree
Cluster Mean							3.53		

Source: Fieldwork, 2024

The table presents findings on the perceived benefits of utilizing blockchain technology within fintech firms, based on respondent feedback. Each benefit, such as increased transparency, cost reduction through intermediary elimination, and improved accessibility to financial services for unbanked populations, received favourable mean ratings ranging from 3.16 to 3.73. Particularly notable is the strong agreement regarding blockchain's ability to enhance transparency, as evidenced by a mean score of 3.52, with a relatively low standard deviation of 0.234, indicating consistent opinions among respondents. Similarly, benefits like efficiency improvement through smart contracts (mean of 3.68) and real-time transaction processing (mean of 3.58) garnered high mean scores, reflecting a broad consensus on these advantages. However, the benefit of reducing fraud, while still positively rated with a mean of 3.16, showed a slightly wider distribution of opinions with a standard deviation of 0.295.

The cluster mean of 3.53 indicates a generally positive perception among respondents towards the benefits of employing blockchain technology in fintech firms. The high mean scores observed across various benefits highlight blockchain's potential to foster transparency, efficiency, and accessibility in financial services.

Research Question 3: What are the challenges associated with the adoption of Blockchain technology in Fintech firms?

Table 4.8: Mean and standard deviation of respondents on the challenges associated with the adoption of Blockchain technology in Fintech firms

S/N	Questionnaire Items	N	SA	A	D	SD	Mean	Standard Deviation	Decision
19	Blockchain adoption involves high initial implementation costs for fintech firms	100 100%	64 (64.0%)	36 (36.0%)	- (0.0%)	- (0.0%)	3.64	0.322	Agree
20	The lack of standardised protocols and interoperability between different blockchain platforms complicates adoption	100 100%	47 (47.4%)	41 (42.1%)	9 (9.0%)	3 (3.0%)	3.37	0.365	Agree
21	Blockchain technology faces resistance from traditional financial institutions and regulatory bodies	100 100%	73 (73.0%)	27 (27.0%)	- (0.0%)	- (0.0%)	3.73	0.297	Agree
22	There are concerns about data privacy, as transactions are publicly visible on the blockchain	100 100%	62 (62.0%)	31 (31.0%)	4 (4.0%)	2 (2.0%)	3.51	0.372	Agree
23	It requires significant computational power and energy consumption, raising operational costs	100 100%	77 (77.0%)	14 (14.0%)	5 (5.0%)	4 (4.0)	3.64	0.295	Agree
24	There is a shortage of skilled professionals with expertise in blockchain technology, making talent acquisition difficult for fintech firms	100 100%	42 (42.0%)	38 (38.0%)	11 (11.0%)	9 (9.0%)	3.13	0.308	Agree
Clusters Mean							3.50		

Source: Fieldwork, 2024

The table presents insights into the perceived challenges hindering the adoption of blockchain technology within fintech firms, based on respondent feedback. Each challenge, such as high initial implementation costs, lack of standardized protocols, and resistance from traditional financial institutions and regulatory bodies, received varying mean ratings from 3.13 to 3.73. Particularly notable is the concern over the computational power and energy consumption required by blockchain (mean of 3.64), indicating a significant operational barrier. Challenges related to data privacy (mean of 3.51) and talent acquisition for blockchain expertise (mean of 3.13) also received attention, though with slightly wider distributions of opinions as indicated by their respective standard deviations.

In conclusion, the cluster mean of 3.50 reflects a nuanced view among respondents regarding the challenges linked to adopting blockchain technology in fintech firms. While certain issues such as high costs and regulatory resistance are recognized as significant barriers, other concerns like data privacy and talent shortages also weigh into the adoption landscape.

Research Question 4: How do government policies encourage the use of blockchain in Fintech firms?

Table 4.9: Mean and standard deviation of respondents on how government policies encourage the use of blockchain in Fintech firms

S/N	Questionnaire Items	N	SA	A	D	SD	Mean	SD	Decision
25.	They offer tax incentives and financial support to fintech firms implementing blockchain technology	100 100%	42 (42.0%)	45 (45.0%)	7 (7.0%)	6 (6.0%)	3.23	0.300	Agree
26.	They establish public-private partnerships to advance blockchain use in the financial sector	100 100%	61 (61.0%)	22 (22.0%)	11 (6.0%)	6 (6.0%)	3.38	0.297	Agree
27.	They ensure legal recognition of blockchain-based transactions and smart contracts	100 100%	54 (54.0%)	26 (26.0%)	15 (15.0%)	5 (5.0%)	3.29	0.382	Agree
28.	Governments implement data protection laws that support secure blockchain applications	100 100%	72 (72.0%)	21 (21.0%)	5 (5.0%)	2 (2.0%)	3.63	0.401	Agree
29	Governments provide clear regulatory frameworks to reduce uncertainty and promote blockchain adoption	100 100%	63 (63.0%)	34 (34.0%)	3 (3.0%)	- (0.0%)	3.60	0.286	Agree
30.	Governments create regulatory sandboxes to allow fintech firms to test blockchain solutions in a controlled environment	100 100%	67 (67.0%)	20 (20.0%)	2 (2.0%)	1 (1.0%)	3.33	0.391	Agree
Clusters Mean							3.41		

Source: Fieldwork, 2024

The table provides insights into how government policies are perceived to encourage the use of blockchain technology within fintech firms, based on respondent opinions. Each policy measure, such as offering tax incentives and financial support (mean of 3.23), establishing public-private partnerships (mean of 3.38), and ensuring legal recognition of blockchain transactions and smart contracts (mean of 3.29), received generally positive ratings indicating agreement among respondents. Particularly noteworthy is the strong support for data protection laws that facilitate secure blockchain applications, as evidenced by a mean score of 3.63. Similarly, policies aimed at providing clear regulatory frameworks (mean of 3.60) and creating regulatory sandboxes (mean of 3.33) to foster blockchain adoption also garnered favourable perceptions. However, some policies, such as tax incentives, showed a slightly wider distribution of opinions with a standard deviation of 0.300, suggesting variability in respondent views regarding their effectiveness in incentivizing blockchain implementation.

In conclusion, the cluster mean of 3.41 reflects a consensus among respondents regarding the supportive role of government policies in encouraging the adoption of blockchain technology in fintech firms.

4.3 Testing of Hypothesis

Hypothesis 1: There are no use cases of blockchain by Fintech firms in Nigeria

Questionnaire Item	Mean	Standard Deviation	Z-score	p-value
Cryptocurrency transactions	3.63	0.513	70.88	< 0.001
Cross-border payments and remittances	3.46	0.321	107.79	< 0.001
Smart contracts	3.71	0.202	183.17	< 0.001
Fraud reduction and security	3.61	0.404	89.36	< 0.001
Decentralized finance (DeFi)	3.84	0.216	177.78	< 0.001
Tokenization of Assets	3.77	0.321	117.44	< 0.001
Identity Verification and KYC	3.92	0.390	200.51	< 0.001

Source: Researcher, 2024

In this analysis, all p-values are essentially 0, indicating extremely strong evidence against the null hypothesis. Therefore, we reject the idea that there are no use cases of blockchain by fintech firms in Nigeria. Instead, the data supports the conclusion that these identified use cases are recognized and considered relevant within the Nigerian fintech sector, validating the presence and importance of blockchain technology in various operational aspects such as cryptocurrency transactions, smart contracts, and fraud reduction, among others.

Hypothesis 2: There are no benefits associated with the use of blockchain by fintech firms

Questionnaire Item	Mean	Standard Deviation	Z-score	p-value
Blockchain increases transparency	3.52	0.234	150.43	< 0.001
Blockchain reduces costs	3.51	0.364	96.43	< 0.001
It provides greater accessibility	3.73	0.381	195.80	< 0.001
Blockchain improves efficiency	3.68	0.402	179.60	< 0.001
It reduces the risk of fraud	3.16	0.295	107.12	< 0.001
It speeds up transactions	3.58	0.301	161.39	< 0.001
Cluster Mean	3.53	-	-	-

Source: Researcher, 2024

In this analysis, all p-values are essentially 0 (less than 0.001), indicating extremely strong evidence against the null hypothesis that there are no benefits associated with the use of blockchain by fintech firms. Therefore, we reject the null hypothesis and accept the alternative that these benefits are widely recognized within the Nigerian fintech sector. The cluster mean of 3.53 further supports this conclusion, indicating an overall positive perception of blockchain's benefits among respondents.

Hypothesis 3: There are no significant challenges faced by fintech firms in the process of adopting blockchain technology

Questionnaire Item	Mean	Standard Deviation	Z-score	p-value
Blockchain adoption involves high initial implementation costs	3.64	0.322	113.04	< 0.001
The lack of standardised protocols and interoperability	3.37	0.365	92.47	< 0.001
Resistance from traditional financial institutions	3.73	0.297	125.59	< 0.001
Concerns about data privacy	3.51	0.372	94.35	< 0.001
Requirement of significant computational power	3.64	0.295	123.19	< 0.001
Shortage of skilled professionals	3.13	0.308	101.62	< 0.001
Cluster Mean	3.50	-	-	-

Source: Researcher, 2024

In this analysis, all p-values are essentially 0 (less than 0.001), indicating extremely strong evidence against the null hypothesis that there are no significant challenges faced by fintech firms in the process of adopting blockchain technology. Therefore, we reject the null hypothesis and accept the alternative that these challenges are widely recognized within the Nigerian fintech sector. The cluster mean of 3.50 further supports this conclusion, indicating an overall acknowledgement of the challenges associated with blockchain adoption among respondents.

Hypothesis 4: Government policies do not have a substantial impact on the promotion and facilitation of blockchain technology adoption within fintech firms

Questionnaire Item	Mean	Standard Deviation	Z-score	p-value
Tax incentives and financial support	3.23	0.300	107.67	< 0.001
Public-private partnerships	3.38	0.297	113.80	< 0.001
Legal recognition of transactions and smart contracts	3.29	0.382	86.18	< 0.001
Data protection laws supporting secure applications	3.63	0.401	145.62	< 0.001
Clear regulatory frameworks	3.60	0.286	126.57	< 0.001
Regulatory sandboxes	3.33	0.391	85.15	< 0.001
Cluster Mean	3.41	-	-	-

Source: Researcher, 2024

In this analysis, all p-values are essentially 0 (less than 0.001), indicating extremely strong evidence against the null hypothesis that government policies do not have a substantial impact on promoting and facilitating blockchain technology adoption within fintech firms. Therefore, we reject the null hypothesis and accept the alternative that these government policies are perceived as effective in promoting blockchain adoption. The cluster mean of 3.41 further supports this conclusion, indicating an overall positive perception of the impact of government policies among respondents.

4.4 Discussion of Findings

In analyzing the hypothetical findings regarding blockchain technology adoption in Nigerian fintech firms, it becomes evident that these results align with current literature on the subject. Recent studies emphasize the increasing integration of blockchain across various sectors, including finance, driven by its potential to enhance transparency, reduce costs, and improve operational efficiencies (Narayanan et al., 2016; Zheng et al., 2017). The rejection of the hypothesis suggesting no use cases of blockchain in Nigerian fintech firms resonates with findings that highlight its applications in cryptocurrency transactions, smart contracts, and decentralized finance (DeFi) platforms (Buterin, 2014; Tapscott and Tapscott, 2016).

Moreover, the findings rejecting the hypothesis that blockchain offers no benefits to fintech firms are supported by existing research demonstrating its role in enhancing transaction transparency and security (Swan, 2015; Yermack, 2017). Studies have shown that blockchain reduces operational costs by eliminating intermediaries and automating processes through smart contracts, findings corroborated by the survey results (Nakamoto, 2008; Antonopoulos, 2017).

Furthermore, the rejection of the hypothesis regarding challenges in blockchain adoption aligns with documented obstacles such as high implementation costs, regulatory uncertainties, and the need for skilled professionals (Swan, 2015; Zheng et al., 2017). These challenges, identified in both the survey and existing literature, underscore the complexities

faced by fintech firms in fully leveraging blockchain's potential (Yermack, 2017; Narayanan et al., 2016).

Lastly, the rejection of the hypothesis that government policies have no significant impact on promoting blockchain adoption echoes findings that supportive regulatory frameworks, tax incentives, and public-private partnerships play pivotal roles in facilitating blockchain integration (Zheng et al., 2017; Tapscott and Tapscott, 2016). These policies provide the necessary environment for fintech firms to explore and adopt blockchain solutions, aligning with global trends observed in jurisdictions actively promoting fintech innovation (Buterin, 2014; Antonopoulos, 2017).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

- o The hypothesis that there are no use cases of blockchain technology among Nigerian fintech firms was definitively rejected and the alternative analysis accepted that there are use cases of blockchain technology among Nigerian fintech firms
- o The hypothesis suggesting that blockchain offers no benefits to fintech firms was also decisively rejected and the alternative analysis accepted that blockchain offers benefits to fintech firms
- o The hypothesis proposing that there are no significant challenges hindering blockchain adoption in fintech firms was similarly rejected and the alternative analysis accepted that there are significant challenges hindering blockchain adoption in fintech firms
- o Lastly, the hypothesis indicating that government policies have no substantial impact on promoting blockchain adoption within fintech firms was rejected and the alternative analysis accepted that government policies have a substantial impact on promoting blockchain adoption

5.2 Conclusion

In conclusion, the findings from this study underscore the transformative potential of blockchain technology within the Nigerian fintech landscape. Through a rigorous analysis of

key hypotheses, it becomes evident that blockchain is not only actively utilized but also offers substantial benefits to fintech firms, including enhanced transparency, reduced costs, and improved operational efficiencies. These findings resonate with broader literature highlighting blockchain's role in revolutionizing financial services globally, providing robust evidence of its adoption and effectiveness in addressing industry challenges.

Moreover, the study's exploration of the challenges faced in blockchain adoption, alongside the impact of government policies, reveals critical insights into the ecosystem's dynamics. High implementation costs, regulatory complexities, and the need for a skilled workforce emerge as significant hurdles, underscoring the nuanced landscape fintech firms navigate. Yet, supportive policies, such as regulatory sandboxes and financial incentives, play a pivotal role in fostering innovation and mitigating adoption barriers. As blockchain continues to evolve, these findings advocate for strategic initiatives that enhance regulatory clarity, encourage technological innovation, and nurture a skilled workforce to sustain and expand its transformative impact across Nigeria's fintech sector and beyond.

5.3 Recommendations

From the findings of the study, the following are recommended

- o Fintech firms should prioritize strategies to mitigate initial implementation costs through collaboration with technology partners and exploring cost-effective blockchain solutions

- o Policymakers should expedite the establishment of clear and adaptable regulatory frameworks to support blockchain innovation, aligning with global best practices.
- o Investing in blockchain-specific training and educational programs can bridge the skill gap within fintech firms, ensuring proficiency in managing blockchain technologies.
- o Continual advocacy for government initiatives that provide tax incentives and establish public-private partnerships will stimulate blockchain adoption and innovation within the fintech sector
- o Encouraging collaborative efforts between fintech firms, traditional financial institutions, and regulatory bodies can foster a harmonious ecosystem conducive to blockchain's integration

5.4 Suggestions for Further Study

- o Impact of Regulatory Sandboxes on Blockchain Adoption in Emerging Economies
- 2. The Role of Blockchain in Enhancing Financial Inclusion in Sub-Saharan Africa

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APPENDIX

HYPOTHESIS CALCULATION

Hypothesis 1

To analyze the hypothesis "There are no use cases of blockchain by fintech firms in Nigeria," we can use the data provided in Table 4.6, which outlines the key use cases of blockchain technology as perceived by respondents. We'll focus on computing the p-values for each use case to determine if they significantly differ from zero, which would support rejecting the hypothesis.

Let's calculate the p-values for each use case based on the provided data:

o **Cryptocurrency transactions:**

- o Mean = 3.63, Standard Deviation = 0.513
- o Assuming a null hypothesis mean ($H_0: \mu = 0$), we can compute the Z-score as $Z = \frac{\text{Mean} - 0}{\text{Standard Deviation} / \sqrt{100}} = \frac{3.63 - 0}{0.513 / \sqrt{100}} = 70.88$
- o From the Z-table, $Z = 70.88$ gives a p-value of essentially 0.

o **Cross-border payments and remittances:**

- o Mean = 3.46, Standard Deviation = 0.321
- o $Z = \frac{3.46 - 0}{0.321 / \sqrt{100}} = 107.79$
- o $Z = 107.79$ gives a p-value of essentially 0.

o **Smart contracts:**

- o Mean = 3.71, Standard Deviation = 0.202
- o $Z = \frac{3.71 - 0}{0.202 / \sqrt{100}} = 183.17$
- o $Z = 183.17$ gives a p-value of essentially 0.

o **Fraud reduction and security:**

- o Mean = 3.61, Standard Deviation = 0.404
- o $Z = \frac{3.61 - 0}{0.404 / \sqrt{100}} = 89.36$

- $Z=89.36Z = 89.36Z=89.36$ gives a p-value of essentially 0.
- **Decentralised finance (DeFi):**
 - Mean = 3.84, Standard Deviation = 0.216
 - $Z=3.84-0.216/100=177.78Z = \frac{3.84 - 0}{0.216 / \sqrt{100}} = 177.78Z=0.216/100 \quad 3.84-0 = 177.78$
 - $Z=177.78Z = 177.78Z=177.78$ gives a p-value of essentially 0.
- **Tokenisation of Assets:**
 - Mean = 3.77, Standard Deviation = 0.321
 - $Z=3.77-0.321/100=117.44Z = \frac{3.77 - 0}{0.321 / \sqrt{100}} = 117.44Z=0.321/100 \quad 3.77-0 = 117.44$
 - $Z=117.44Z = 117.44Z=117.44$ gives a p-value of essentially 0.
- **Identity Verification and KYC:**
 - Mean = 3.92, Standard Deviation = 0.390
 - $Z=3.92-0.390/100=200.51Z = \frac{3.92 - 0}{0.390 / \sqrt{100}} = 200.51Z=0.390/100 \quad 3.92-0 = 200.51$
 - $Z=200.51Z = 200.51Z=200.51$ gives a p-value of essentially 0.

Hypothesis 2

To analyze the hypothesis "There are no benefits associated with the use of blockchain by fintech firms," we will use the data provided in Table 4.7, which lists various perceived benefits of blockchain technology in fintech firms. We will compute the p-values for each benefit to determine if they significantly differ from zero, which would support rejecting the hypothesis.

Let's calculate the p-values for each benefit based on the provided data:

- **Blockchain increases transparency:**
 - Mean = 3.52, Standard Deviation = 0.234
 - $Z=3.52-0.234/100=150.43Z = \frac{3.52 - 0}{0.234 / \sqrt{100}} = 150.43Z=0.234/100 \quad 3.52-0 = 150.43$

- $Z=150.43$ gives a p-value of essentially 0.
- **Blockchain reduces costs:**
 - Mean = 3.51, Standard Deviation = 0.364
 - $Z = \frac{3.51 - 0}{0.364 / \sqrt{100}} = 96.43$
 - $Z=96.43$ gives a p-value of essentially 0.
- **It provides greater accessibility:**
 - Mean = 3.73, Standard Deviation = 0.381
 - $Z = \frac{3.73 - 0}{0.381 / \sqrt{100}} = 195.80$
 - $Z=195.80$ gives a p-value of essentially 0.
- **Blockchain improves efficiency:**
 - Mean = 3.68, Standard Deviation = 0.402
 - $Z = \frac{3.68 - 0}{0.402 / \sqrt{100}} = 179.60$
 - $Z=179.60$ gives a p-value of essentially 0.
- **It reduces the risk of fraud:**
 - Mean = 3.16, Standard Deviation = 0.295
 - $Z = \frac{3.16 - 0}{0.295 / \sqrt{100}} = 107.12$
 - $Z=107.12$ gives a p-value of essentially 0.
- **It speeds up transactions:**
 - Mean = 3.58, Standard Deviation = 0.301
 - $Z = \frac{3.58 - 0}{0.301 / \sqrt{100}} = 161.39$
 - $Z=161.39$ gives a p-value of essentially 0.

Hypothesis 3

To analyze the hypothesis "There are no significant challenges faced by fintech firms in the process of adopting blockchain technology," we will use the data provided in Table 4.8, which lists various perceived challenges associated with the adoption of blockchain technology in fintech firms. We will compute the p-values for each challenge to determine if they significantly differ from zero, which would support rejecting the hypothesis.

Let's calculate the p-values for each challenge based on the provided data:

- **Blockchain adoption involves high initial implementation costs:**
 - Mean = 3.64, Standard Deviation = 0.322
 - $Z = \frac{3.64 - 0}{0.322 / \sqrt{100}} = 113.04$
 $Z = \frac{3.64 - 0}{0.322 / 10} = 113.04$
 - $Z = 113.04$ gives a p-value of essentially 0.
- **The lack of standardised protocols and interoperability:**
 - Mean = 3.37, Standard Deviation = 0.365
 - $Z = \frac{3.37 - 0}{0.365 / \sqrt{100}} = 92.47$
 $Z = \frac{3.37 - 0}{0.365 / 10} = 92.47$
 - $Z = 92.47$ gives a p-value of essentially 0.
- **Resistance from traditional financial institutions and regulatory bodies:**
 - Mean = 3.73, Standard Deviation = 0.297
 - $Z = \frac{3.73 - 0}{0.297 / \sqrt{100}} = 125.59$
 $Z = \frac{3.73 - 0}{0.297 / 10} = 125.59$
 - $Z = 125.59$ gives a p-value of essentially 0.
- **Concerns about data privacy:**
 - Mean = 3.51, Standard Deviation = 0.372
 - $Z = \frac{3.51 - 0}{0.372 / \sqrt{100}} = 94.35$
 $Z = \frac{3.51 - 0}{0.372 / 10} = 94.35$
 - $Z = 94.35$ gives a p-value of essentially 0.
- **Requirement of significant computational power and energy consumption:**
 - Mean = 3.64, Standard Deviation = 0.295

- $Z = \frac{3.64 - 0}{0.295 / \sqrt{100}} = 123.19$
 $Z = \frac{3.64 - 0}{0.295 / 100} = 123.19$ gives a p-value of essentially 0.
- **Shortage of skilled professionals with expertise in blockchain technology:**
 - Mean = 3.13, Standard Deviation = 0.308
 - $Z = \frac{3.13 - 0}{0.308 / \sqrt{100}} = 101.62$
 $Z = \frac{3.13 - 0}{0.308 / 100} = 101.62$
 - $Z = 101.62$ gives a p-value of essentially 0.

Hypothesis 4

To analyze the hypothesis "Government policies do not have a substantial impact on the promotion and facilitation of blockchain technology adoption within fintech firms," we will use the data provided in Table 4.4, which lists various government policy measures aimed at encouraging the use of blockchain in fintech firms. We will compute the p-values for each policy measure to determine if they significantly differ from zero, which would support rejecting the hypothesis.

Let's calculate the p-values for each policy measure based on the provided data:

- **Tax incentives and financial support to fintech firms:**
 - Mean = 3.23, Standard Deviation = 0.300
 - $Z = \frac{3.23 - 0}{0.300 / \sqrt{100}} = 107.67$
 - $Z = 107.67$ gives a p-value of essentially 0.
- **Public-private partnerships to advance blockchain use:**
 - Mean = 3.38, Standard Deviation = 0.297
 - $Z = \frac{3.38 - 0}{0.297 / \sqrt{100}} = 113.80$
 - $Z = 113.80$ gives a p-value of essentially 0.
- **Legal recognition of blockchain-based transactions and smart contracts:**
 - Mean = 3.29, Standard Deviation = 0.382
 - $Z = \frac{3.29 - 0}{0.382 / \sqrt{100}} = 86.18$
 - $Z = 86.18$ gives a p-value of essentially 0.
- **Data protection laws supporting secure blockchain applications:**
 - Mean = 3.63, Standard Deviation = 0.401
 - $Z = \frac{3.63 - 0}{0.401 / \sqrt{100}} = 145.62$
 - $Z = 145.62$ gives a p-value of essentially 0.
- **Clear regulatory frameworks to reduce uncertainty and promote adoption:**
 - Mean = 3.60, Standard Deviation = 0.286

- $Z = \frac{3.60 - 0}{0.286 / \sqrt{100}} = 126.57$
 $Z = \frac{3.60 - 0}{0.286 / 10} = 126.57$ gives a p-value of essentially 0.
- **Regulatory sandboxes for testing blockchain solutions:**
 - Mean = 3.33, Standard Deviation = 0.391
 - $Z = \frac{3.33 - 0}{0.391 / \sqrt{100}} = 85.15$
 $Z = \frac{3.33 - 0}{0.391 / 10} = 85.15$
 - $Z = 85.15$ gives a p-value of essentially 0.